Math for College Readiness Module 10 Study Guide

[Click here for the Module 10 Help Videos]

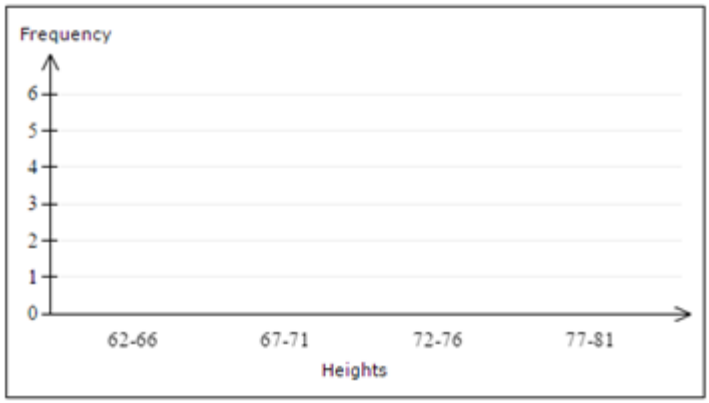
1.)

Constructing a histogram for numerical data

The heights (in inches) of a sample of 17 adult males are:

69 , 81 , 70 , 74 , 75 , 76 , 63 , 77 , 79 , 67 , 62 ,
65 , 68 , 72 , 71 , 80 , 66

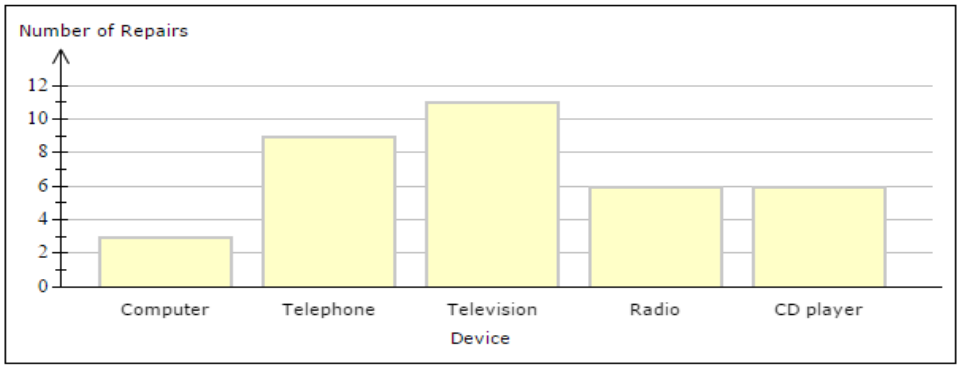
Draw the histogram for these data.



2.)

Interpreting a bar graph

A shop repairs 5 types of electronic devices. The number of repairs of each device last week is shown in the bar graph below. Use this bar graph to answer the questions.



(a) Which device was repaired the least often? How many repairs were made on that device?

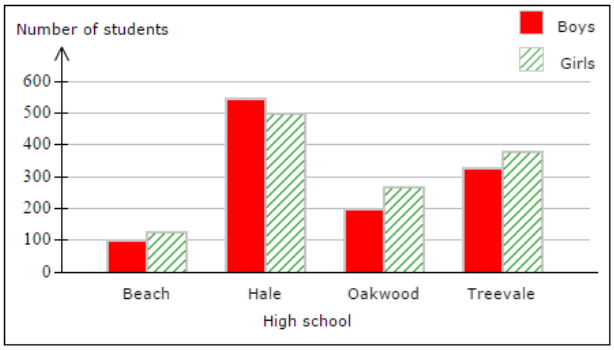
(b) How many more repairs were made on radios than computers?

(c) How many devices had at most 6 repairs?

3.)

Interpreting a double bar graph

There are four high schools in the South School District. The double bar graph below shows how many boys and girls are at each school. Use this graph to answer the questions.



(a) Estimate the number of girls at Treevale.

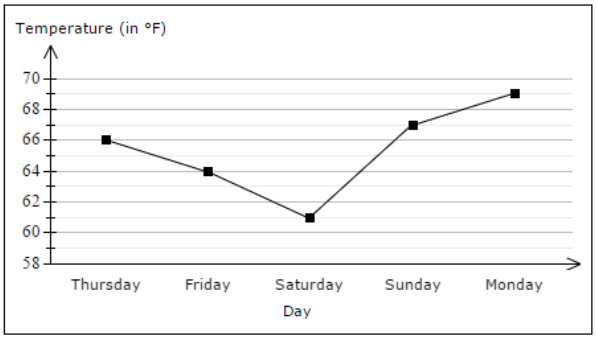
(b) Which schools have more boys than girls?

(c) Estimate the total number of students at Oakwood.

4.)

Interpreting a line graph

The graph below shows the noon temperatures for five days.



(a) What was the least noon temperature for the five days?

[ ] ° F

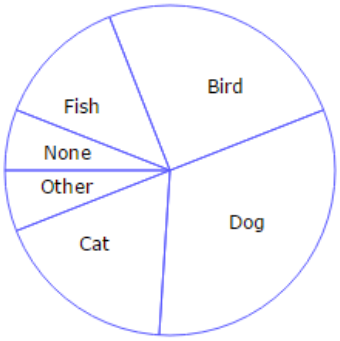
(b) When did the greatest increase in noon temperature occur?

- Thursday to Friday
- Friday to Saturday
- Saturday to Sunday
- Sunday to Monday

5.)

Interpreting a circle graph or pie chart

Each person in a community was asked, "What is your favorite type of pet?" The circle graph below summarizes their answers.



(a) Which category was chosen by approximately one-fourth of the community?

(b) Approximately what percentage of the community chose Cat or Dog?

6.)

Finding if a question can be answered by the data

Ms. Smith took some students from her class on a field trip. Of the 20 students in the class, $\frac{4}{5}$ went on the trip and 11 of these were boys.

Use this information to answer the questions below.

If not enough information is given to answer a question, click on "Not enough information."

(a) How many boys from the class did not go on the field trip?

(b) How many girls are in the class?

(c) How many students from the class did not go on the field trip?

7.) **Calculating relative frequencies**

Calculating relative frequencies in a contingency table

A sample of 359 people is selected. The people sampled are classified according to their place of residence and the highest educational degree that they have earned. The results are given in the contingency table below.

		Highest degree earned			
		No college degree	Two-year degree	Four-year degree	Advanced degree
Place of residence	Urban	49	24	20	18
	Suburban	49	35	32	23
	Rural	43	33	18	15

Among the people in the sample whose highest degree is a four-year degree, what is the relative frequency of those whose place of residence happens to be rural?

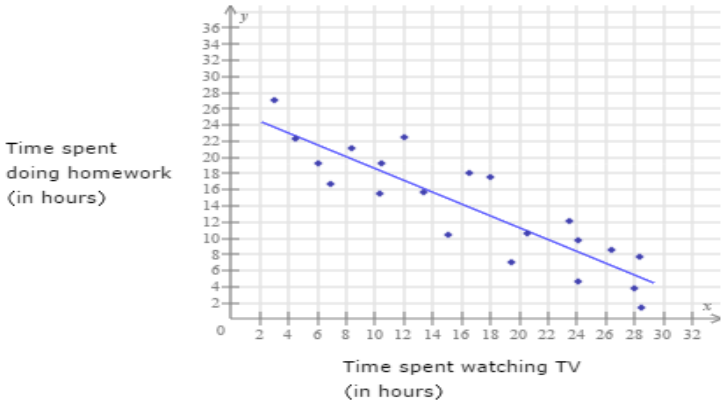
Round your answer to at least two decimal places.

8.) **Scatterplots and Correlation**

Scatter plots and correlation

The scatter plot shows the time spent watching TV and the time spent doing homework by each of 21 students last week. Also shown is the line of best fit for the data.

Fill in the blanks below.



(a) For these 21 students, as the time spent watching TV increases, the time spent doing homework tends to ? .

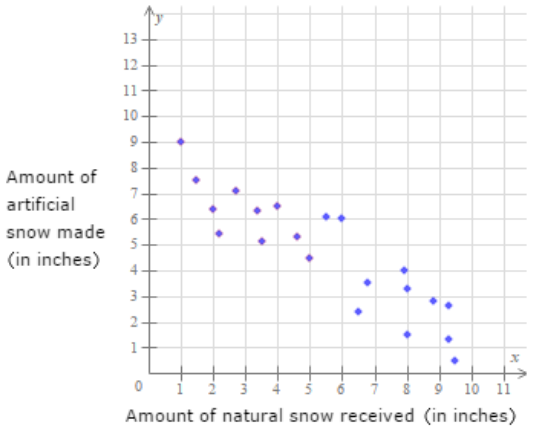
(b) For these 21 students, the correlation between time spent watching TV and time spent doing homework is ? .

(c) Using the line of best fit, we would predict that a student watching 15 hours of TV would do homework for approximately ? hours.

9.)

Sketching the line of best fit

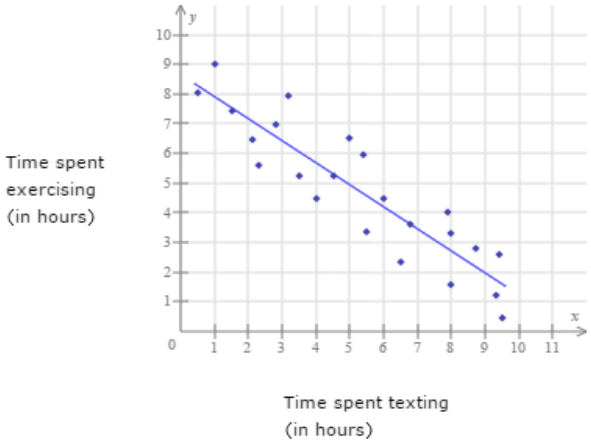
The data points on the scatter plot below show the amount of natural snow received and the amount of artificial snow made by a ski resort for each of 21 weeks.
Draw the line of best fit for these data points. (It doesn't have to be the exact line of best fit. Just draw your best approximation.)



10.)

Predictions from the line of best fit

The scatter plot shows the time spent texting, x, and the time spent exercising, y, by each of 23 students last week.



Use the equation of the line of best fit, $y = -0.74x + 8.64$, to answer the questions below.

Give exact answers, not rounded approximations.

(a) What is the predicted time spent exercising for a student who doesn't spend any time texting?	
(b) What is the predicted time spent exercising for a student who spends 4 hours texting?	
(c) For an increase of one hour in the time spent texting, what is the predicted decrease in the time spent exercising?	

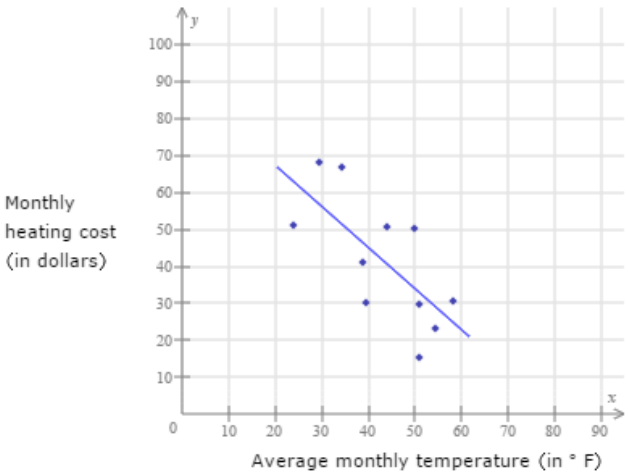
11.) **Computing Residuals**

Computing residuals

The table and scatter plot show the average monthly temperature, x, and a family's monthly heating cost, y, for 11 different months.

The equation of the line of best fit is $y = -1.1x + 89.95$.

Average monthly temperature, x (in ° F)	Monthly heating cost, y (in dollars)
24.0	51.00
29.3	68.00
34.3	67.00
38.8	40.95
39.6	30.09
44.0	50.75
49.9	50.32
50.9	29.86
51.0	15.39
54.2	23.31
58.0	30.50



Use the equation of the line of best fit to fill in the blanks below.
Give exact answers, not rounded approximations.

Average monthly temperature (in $°F$)	Observed monthly heating cost (in dollars)	Predicted monthly heating cost (in dollars)	Residual (in dollars)
24.0			
34.3			

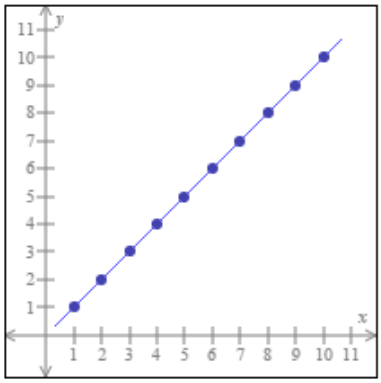
12.)

Interpreting residual plots

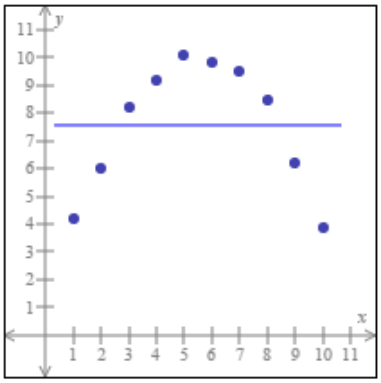
Shown below are three scatter plots and their lines of best fit.
Also shown are three residual plots.

Answer the questions that follow.

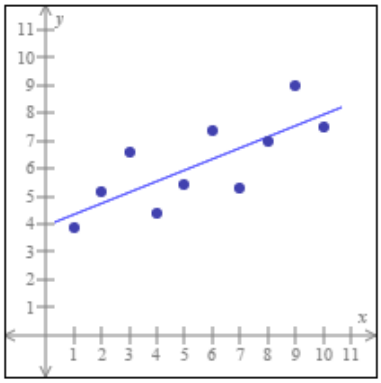
Scatter Plot A



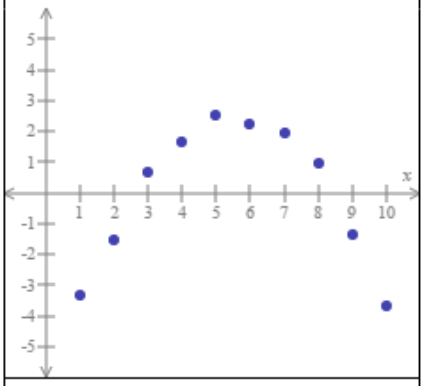
Scatter Plot B



Scatter Plot C



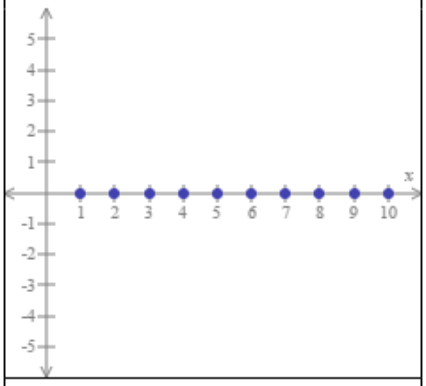
Residual Plot 1



Which scatter plot matches this residual plot?

What best describes the line of best fit for the scatter plot?

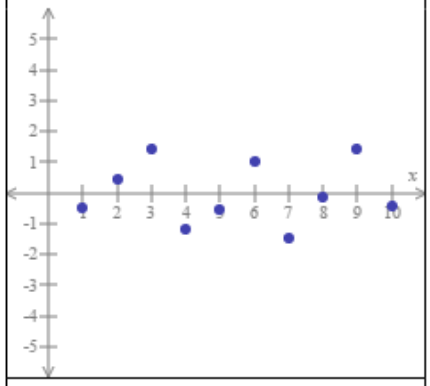
Residual Plot 2



Which scatter plot matches this residual plot?

What best describes the line of best fit for the scatter plot?

Residual Plot 3



Which scatter plot matches this residual plot?

What best describes the line of best fit for the scatter plot?

13.)

Linear relationship and the correlation coefficient

Shown below are the scatter plots for four different data sets.

Answer the questions that follow. The same response may be the correct answer for more than one question.

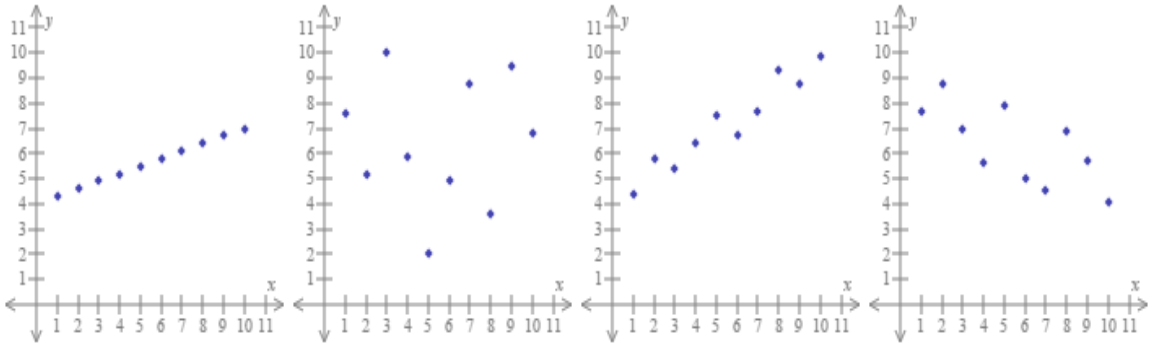


Figure 1 | Figure 2 | Figure 3 | Figure 4

1. For which data set does the correlation coefficient ***r*** appear to be equal to 1?	
2. Which data set has an apparent negative, but not perfect, linear relationship between its two variables?	
3. Which data set indicates the strongest linear relationship between its two variables?	

14.)

Identifying correlation and causation

Answer the questions below.

1. A health group conducted a survey. It showed that a heavier newborn did not necessarily need a larger or smaller amount of diapers. What is likely true?

- There is *no* correlation between birth weight and amount of diapers needed.
- There is a correlation between birth weight and amount of diapers needed. There may or may not be causation. Further studies would have to be done to determine this.
- There is a correlation between birth weight and amount of diapers needed. There is probably also causation. This is because there would be a *decrease* in the amount of diapers needed with an *increase* in the birth weight.

2. A government study found that people buy more gasoline when the price per gallon decreases. What can we determine?

- There is *no* correlation between amount of gasoline bought and price.
- There is a correlation between amount of gasoline bought and price. However, there is no causation. This is because there is an *increase* in the amount of gasoline bought with a *decrease* in the price.
- There is a correlation between amount of gasoline bought and price. There may or may not be causation. Further studies would have to be done to determine this.

15.)

Computing a percentage from a table of values

A movie club surveyed 150 high school students. The students were asked how often they go to the movies and whether they prefer comedies or dramas. Their responses are summarized in the following table.

	Twice a month or less	Three times a month or more
Comedy	47	13
Drama	61	29

(a) What percentage of the students prefer dramas ?

(b) What percentage of the students go to the movies three times a month or more?